

FIG. 2

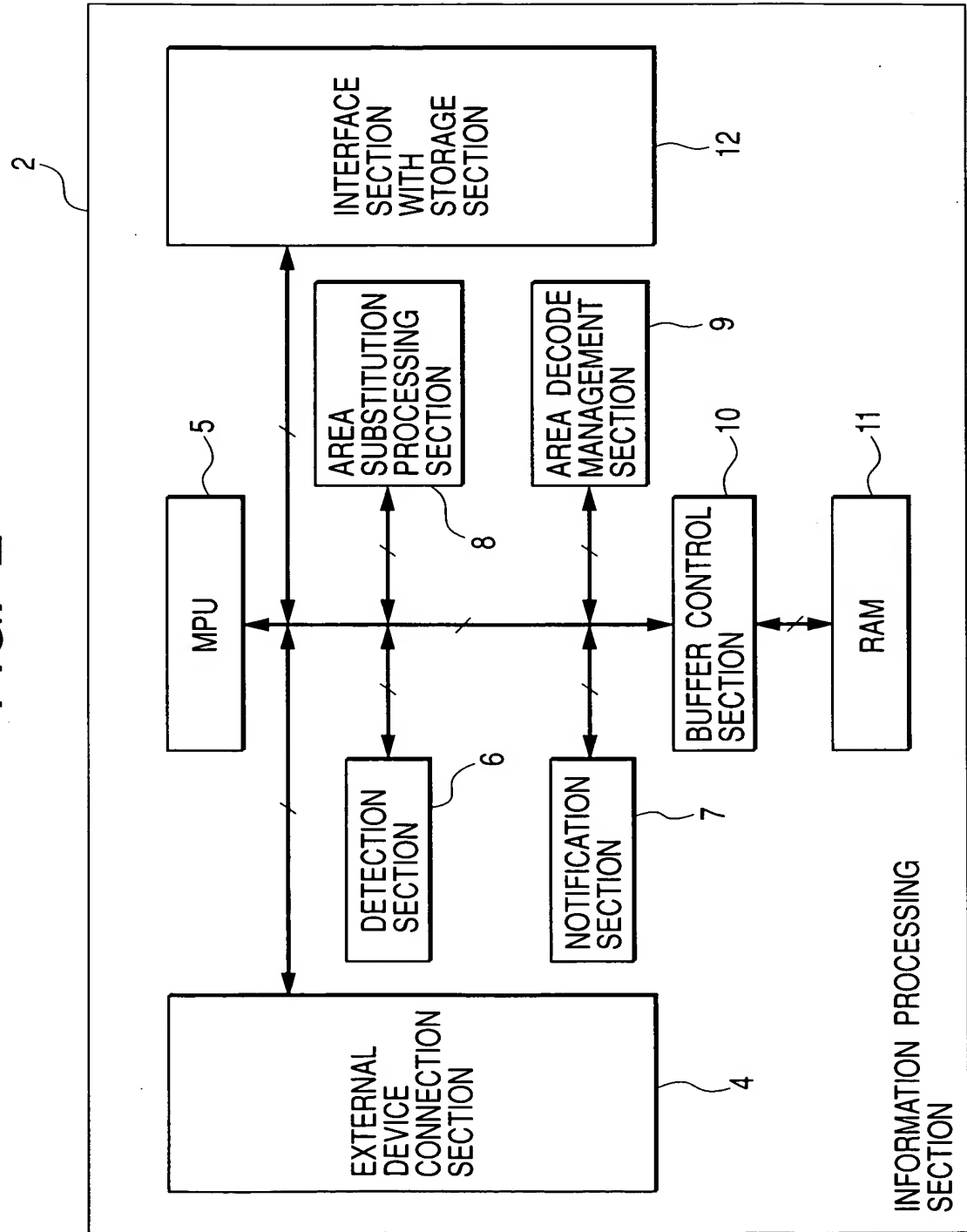


FIG. 3

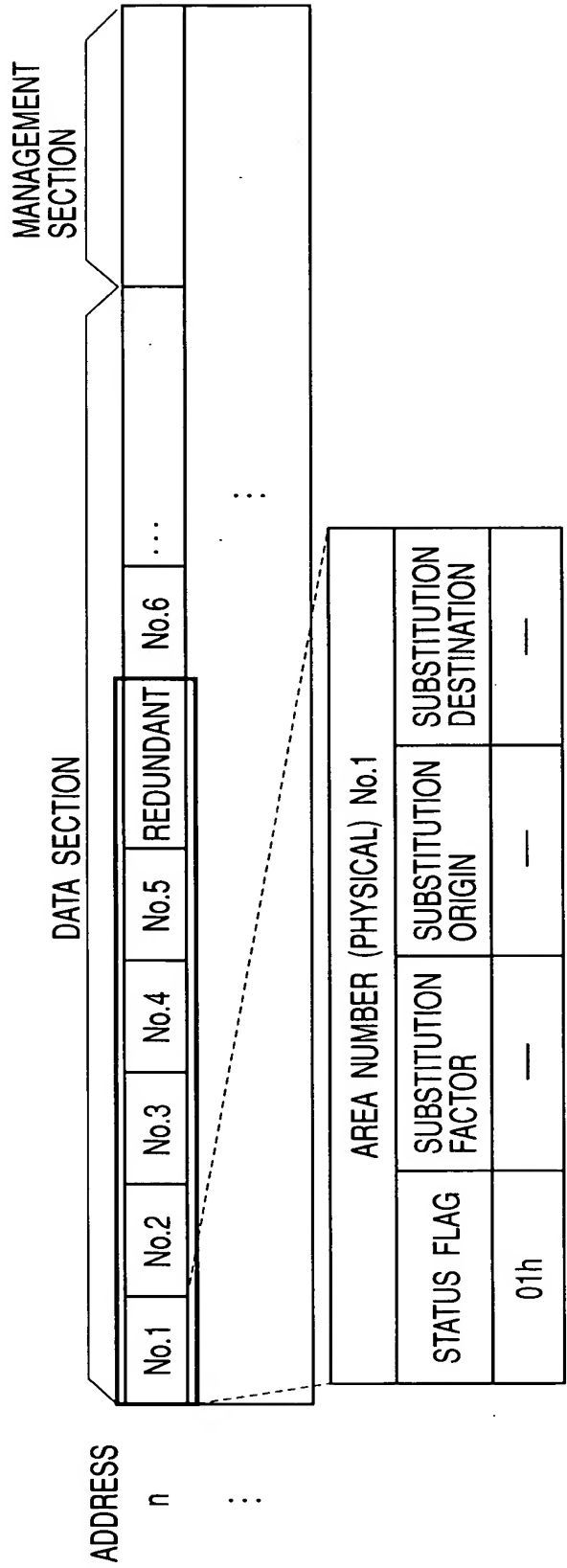
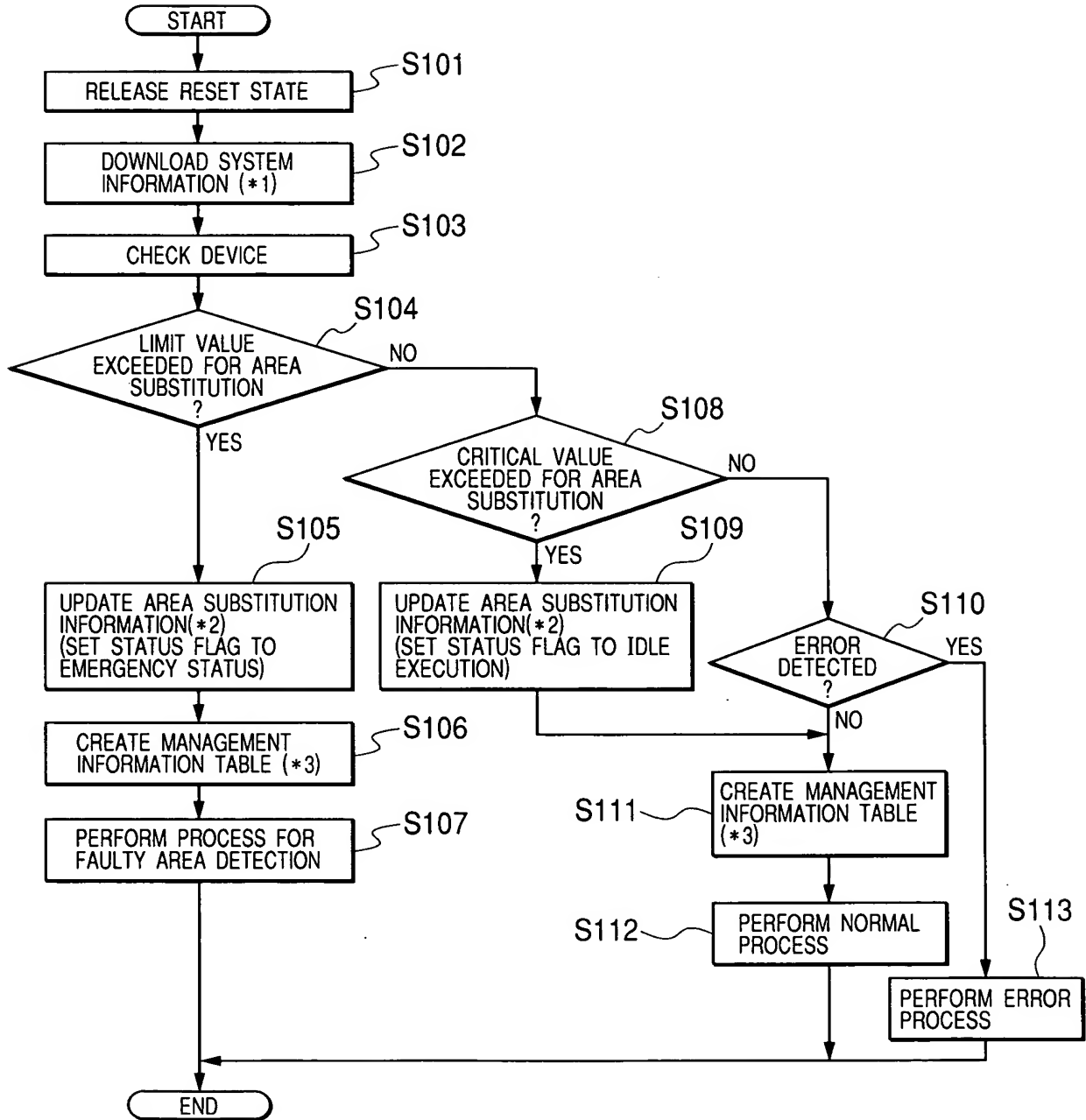


FIG. 4

[STATUS FLAG]	[SUBSTITUTION FACTOR]
00h: NORMAL (UNUSED)	SEE FIG. 5
01h: NORMAL (USED)	
08h: AREA SUBSTITUTION COMPLETED; SUBSTITUTION ORIGIN	[SUBSTITUTION ORIGIN]
09h: AREA SUBSTITUTION COMPLETED; SUBSTITUTION DESTINATION	PHYSICAL AREA NUMBER OF AREA SUBSTITUTION ORIGIN
0Ah: AREA SUBSTITUTION COMPLETED AFTER BEING USED AS A SUBSTITUTE AREA; SUBSTITUTION ORIGIN	
0Bh: AREA SUBSTITUTION COMPLETED AFTER BEING USED AS A SUBSTITUTE AREA; SUBSTITUTION DESTINATION	[SUBSTITUTION DESTINATION]
0Ch: IDLE COMPLETED; SUBSTITUTION ORIGIN	PHYSICAL AREA NUMBER OF AREA SUBSTITUTION DESTINATION
0Dh: IDLE COMPLETED; SUBSTITUTION DESTINATION	
0Eh: IDLE COMPLETED AFTER BEING USED AS A SUBSTITUTE AREA; SUBSTITUTION ORIGIN	
0Fh: IDLE COMPLETED AFTER BEING USED AS A SUBSTITUTE AREA; SUBSTITUTION DESTINATION	
FFh: SUBSTITUTE AREA EXHAUSTED	

FIG. 5

AREA	SUBSTITUTION FACTOR	SUBSTITUTION FACTOR VALUE	LIMIT VALUE	CRITICAL VALUE	RETRY REQUIRED ?
SUBSTITUTE FREE AREA		1h	0	20 BLOCKS OR LESS	—
	SUCCESSIVE PROGRAM ERROR	2h	260 TIMES OR MORE	10 TIMES OR MORE	REQUIRED
	EXCESSIVE WRITE ERROR	3h	260 TIMES OR MORE	10 TIMES OR MORE	REQUIRED
SUCCESSIVE RETRY ERROR	RETENTION FAILURE (VERIFY CHECK ERROR)	4h	260 TIMES OR MORE	10 TIMES OR MORE	REQUIRED
	ECC UNCORRECTABLE ERROR AT RETENTION FAILURE	5h	ONCE	—	—
	DEVICE/MANUFACTURE CODE UNREADABLE ERROR	6h	ONCE	—	—
PHYSICAL AMOUNT	ERASURE/PROGRAM TIME	7h	100ms	10ms	—
	NUMBER OF ERASURES	8h	1M TIMES	300K TIMES	—
	READ CURRENT VALUE	9h	1.2A OR MORE	700mA OR MORE	—
	WRITE CURRENT VALUE	Ah	1.5A OR MORE	1.0A OR MORE	—
	EXTERNALLY SUPPLIED POWER/CURRENT VALUE	Bh	3A OR MORE	1.5A OR MORE	—

FIG. 6

(*1): DOWNLOAD THE SYSTEM INFORMATION CONTAINING AREA SUBSTITUTION INFORMATION TO THE WORK AREA.

REFERENCE THE AREA SUBSTITUTION INFORMATION TO AVOID A FAULTY CHIP, AND DOWNLOAD THE SYSTEM INFORMATION

(*2): UPDATE ONLY DATA IN THE WORK AREA

(*3): REFERENCE THE AREA SUBSTITUTION INFORMATION TO AVOID A FAULTY AREA, AND CREATE A TABLE BASED ON THE MANAGEMENT AREA INFORMATION IN THE MEMORY

FIG. 7

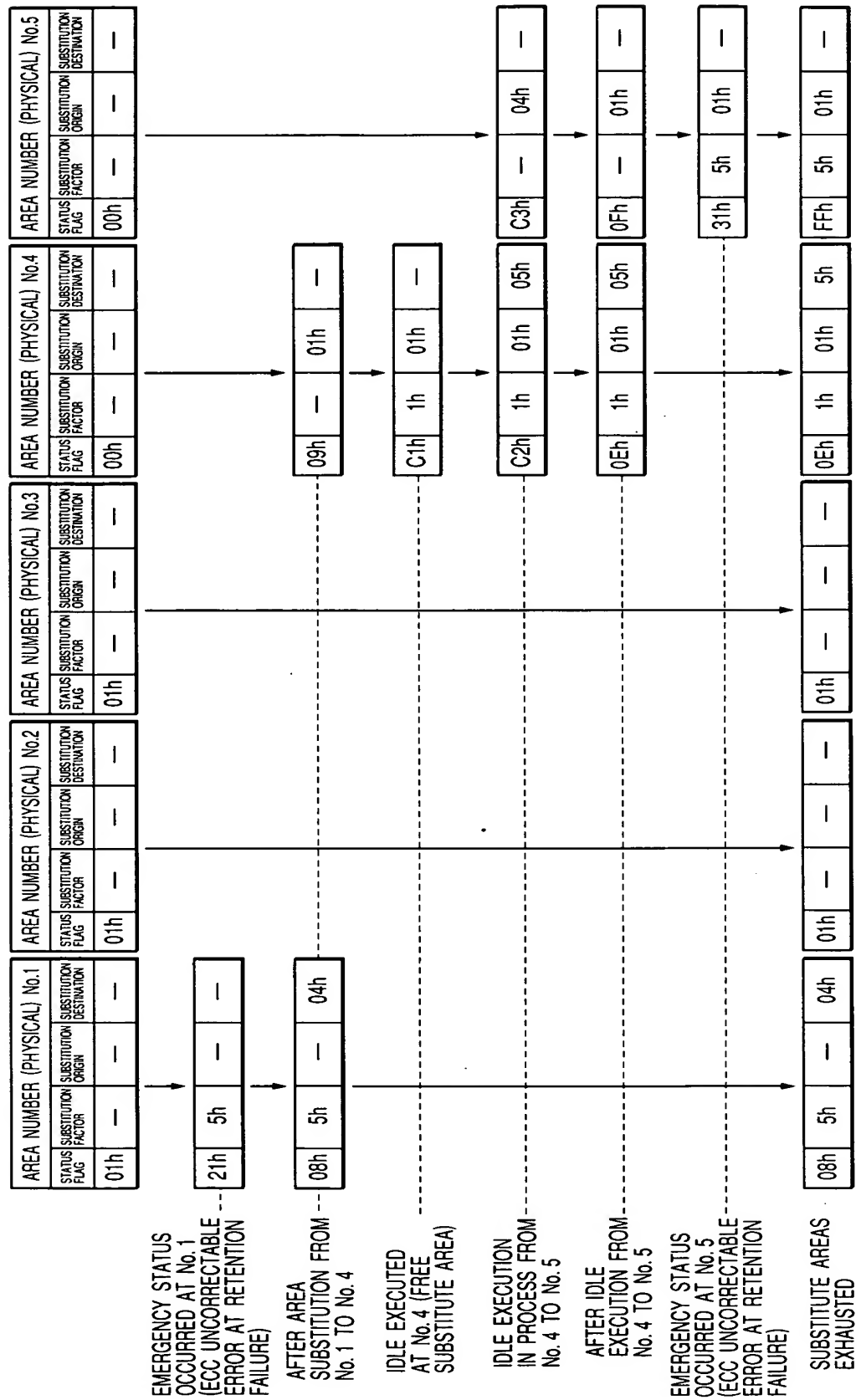


FIG. 8

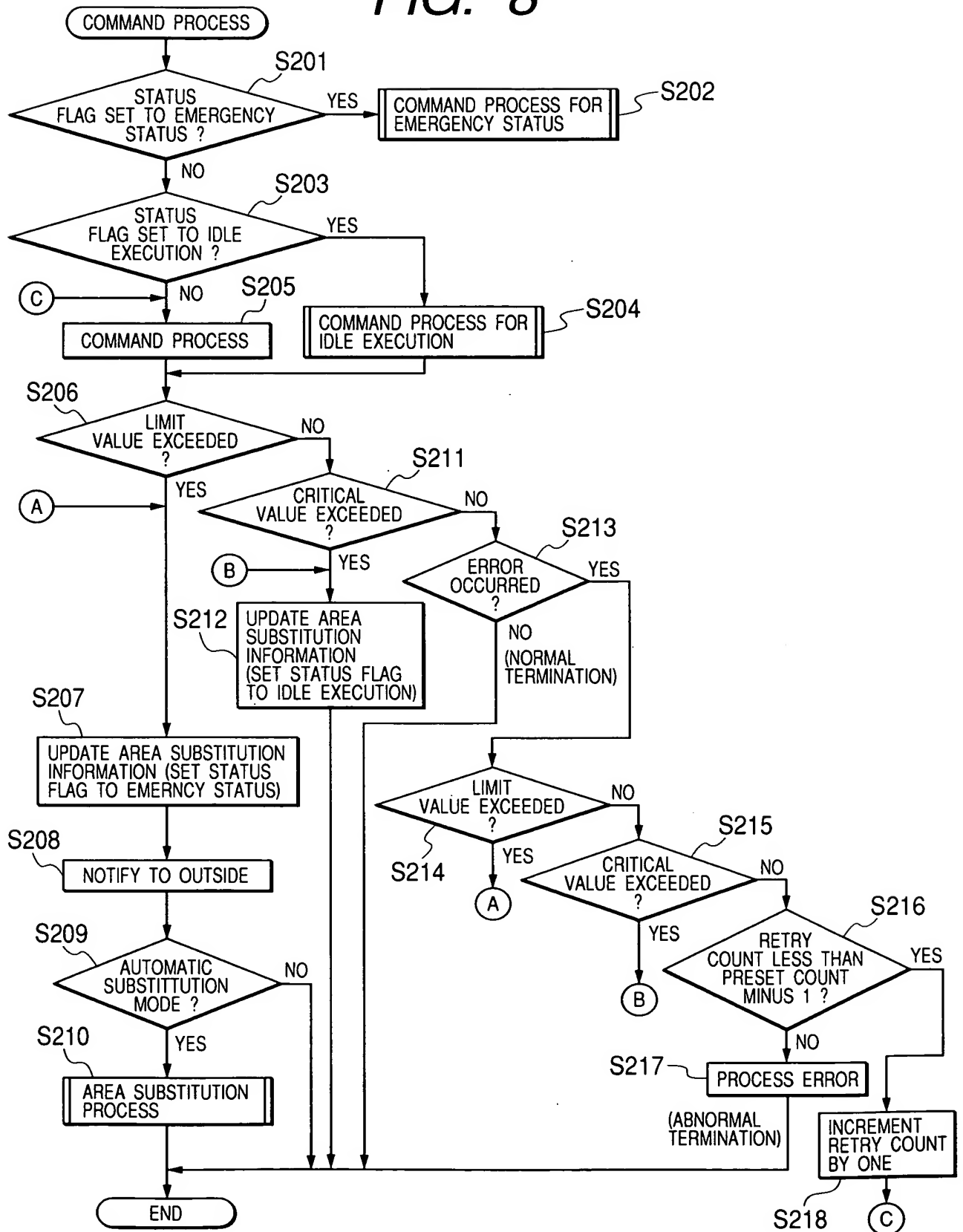


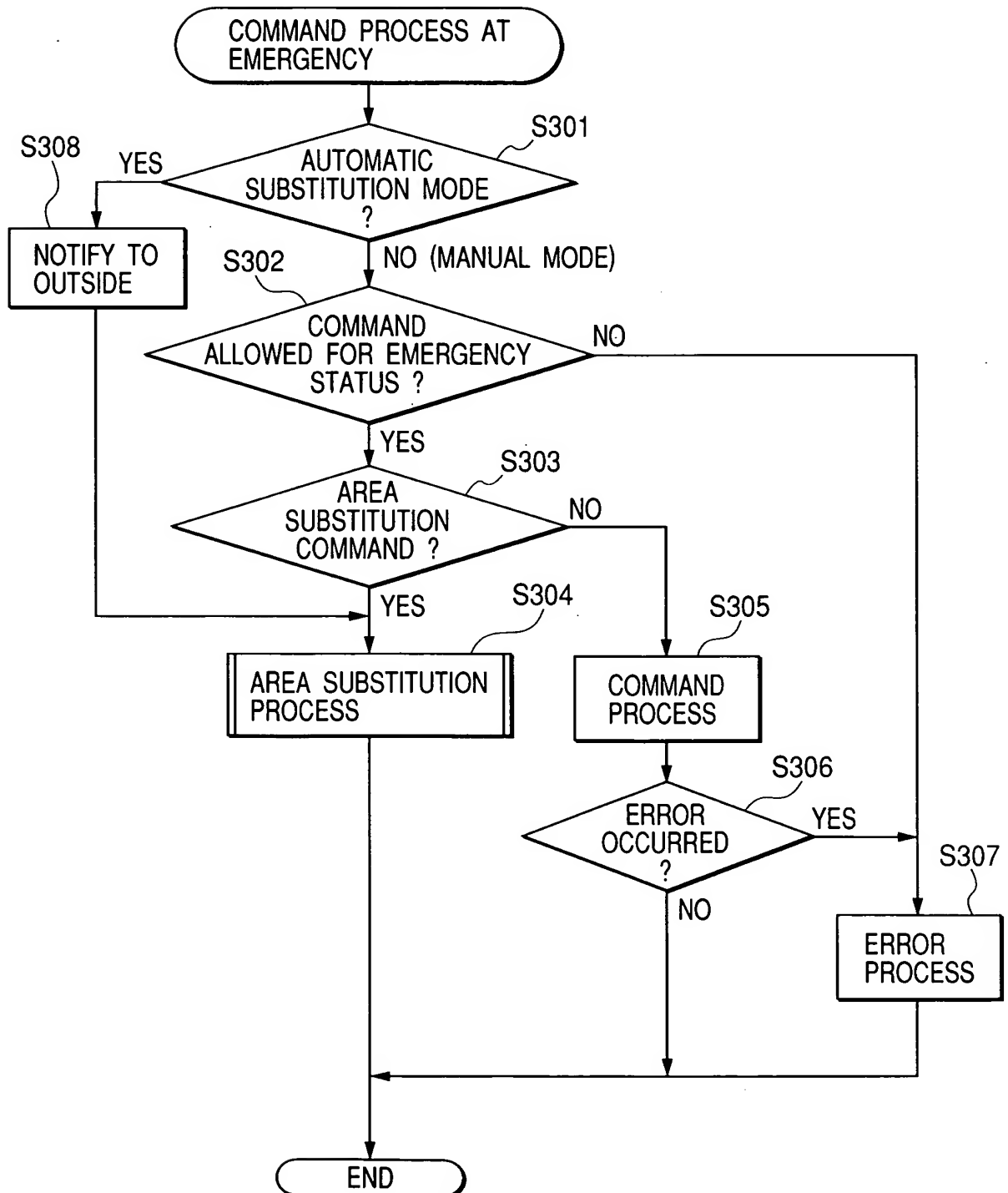
FIG. 9

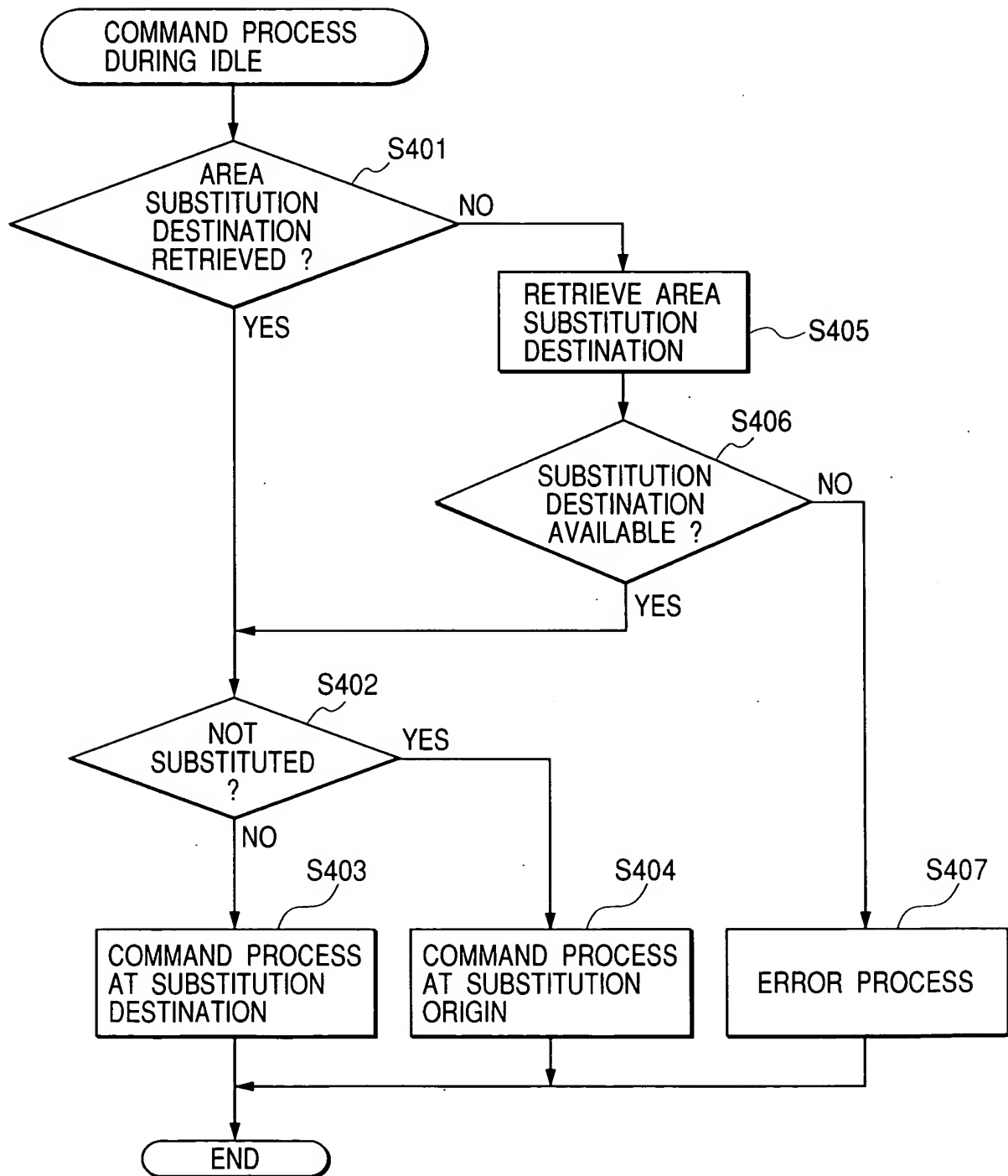
FIG. 10

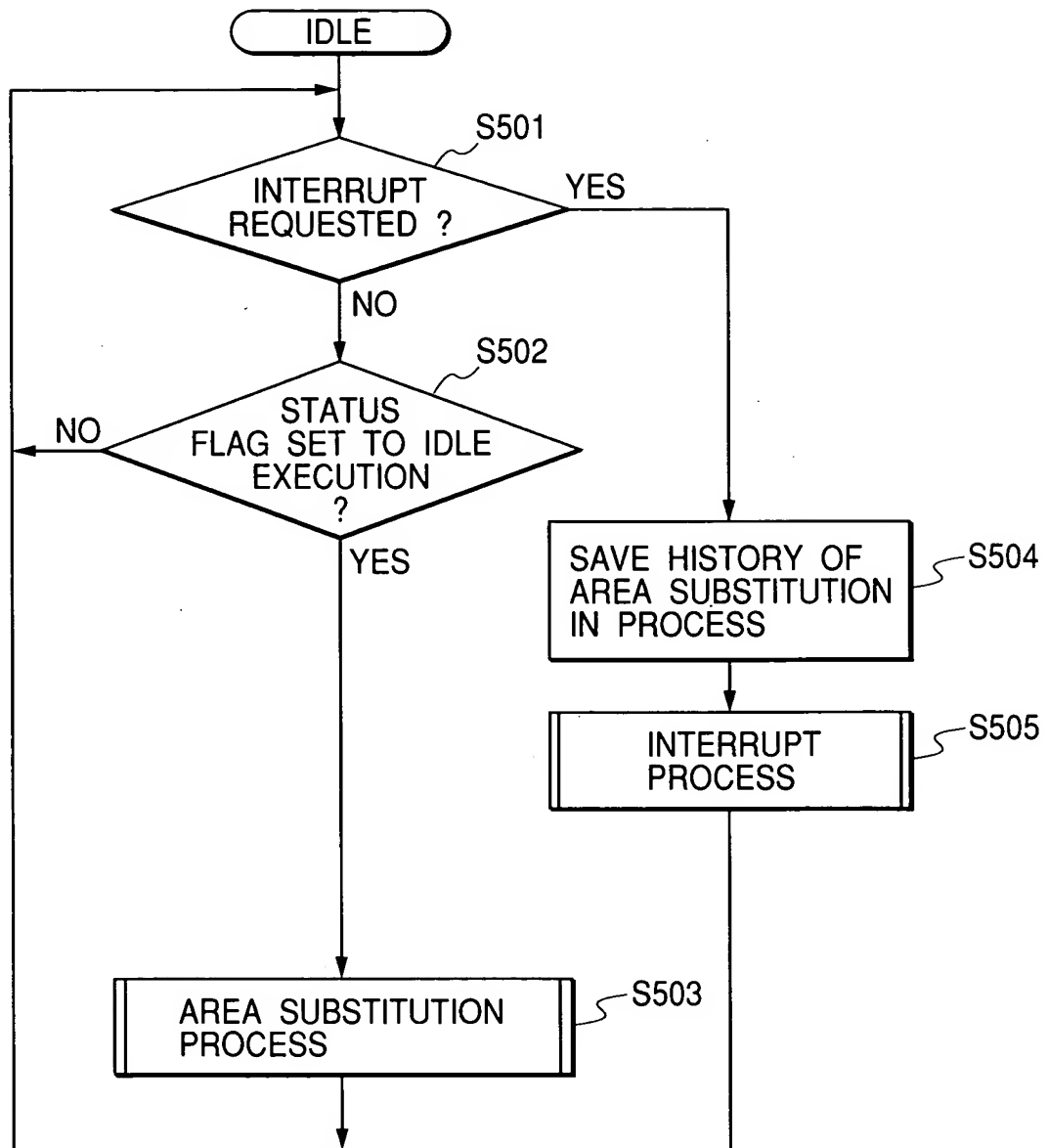
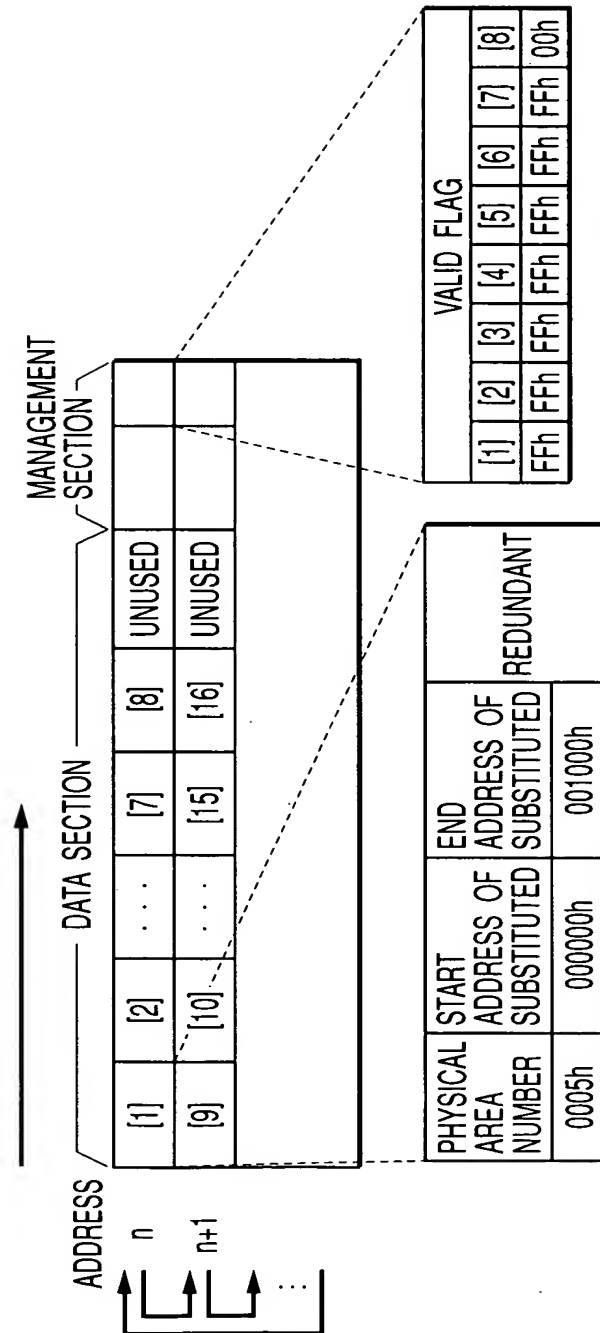
FIG. 11

FIG. 12(a)



- FFh=WRITING PERFORMED, 00h=NO WRITING PERFORMED
- THE LAST TABLE WHERE FFh IS WRITTEN IS VALID DATA IN THIS EXAMPLE, TABLE (7) IS VALID DATA
- AN OPERATION OF WRITING TABLE (9) WRITES DATA (INCLUDING VALID FLAGS) IN TABLE (9), AND THEN CLEARS DATA AT ADDRESS "n"

FIG. 12(b)

VALID TABLE	PHYSICAL AREA NUMBER	START ADDRESS OF SUBSTITUTED	END ADDRESS OF SUBSTITUTED
0007h	0005h	000000h	001000h

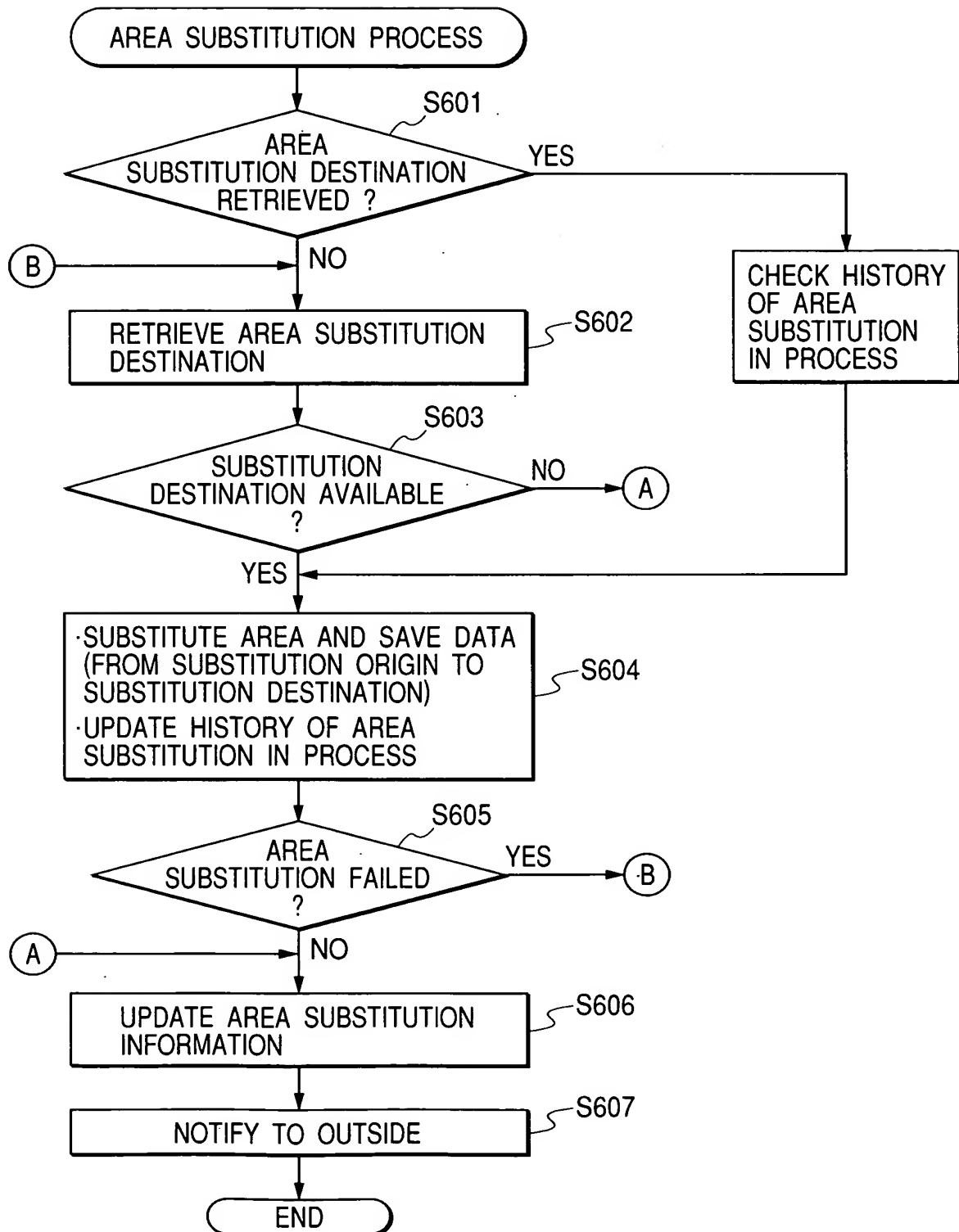
FIG. 13

FIG. 14

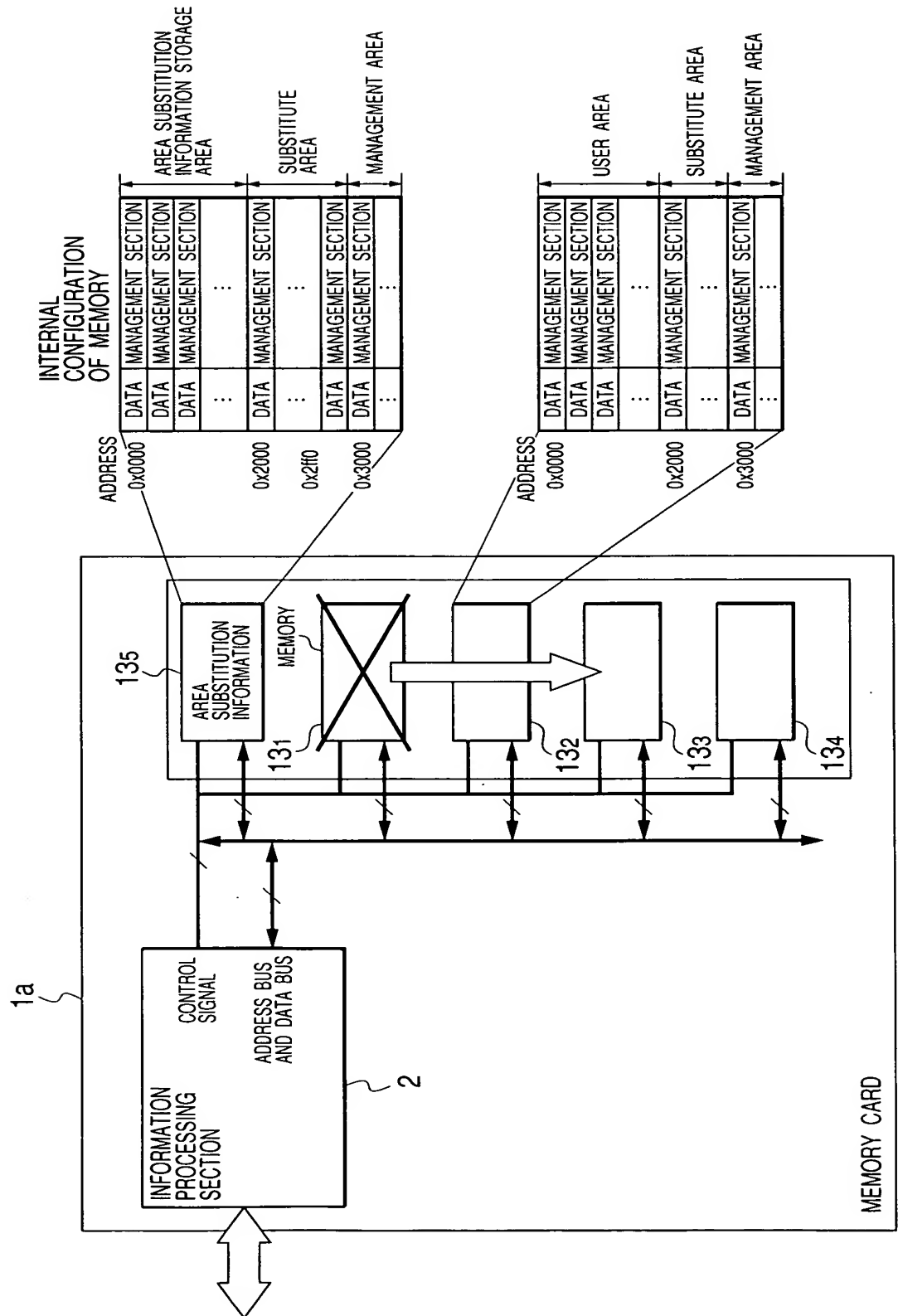


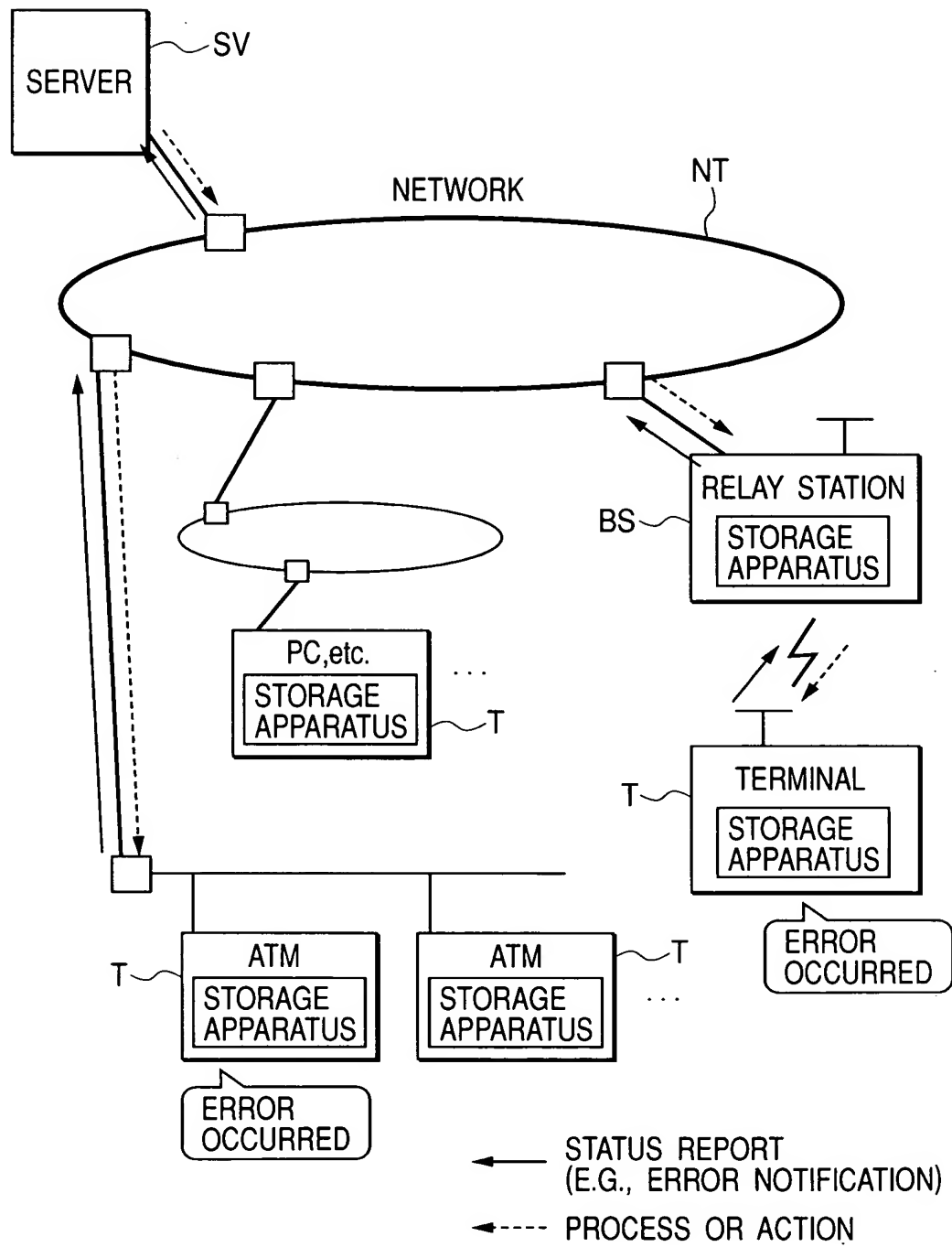
FIG. 15

FIG. 16

